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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR        | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|-----------------------------|---------------------|------------------|
| 09/530,512      | 06/26/2000  | EVGENY INVIEVICH GIVARGIZOV | GIVAR.001APC        | 7492             |

20995 7590 01/29/2003

KNOBBE MARTENS OLSON & BEAR LLP  
2040 MAIN STREET  
FOURTEENTH FLOOR  
IRVINE, CA 92614

EXAMINER

CLEVELAND, MICHAEL B

ART UNIT PAPER NUMBER

1762

DATE MAILED: 01/29/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/530,512

Applicant(s)

GIVARGIZOV ET AL. *PS*

Examiner

Michael Cleveland

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 15-29 is/are pending in the application.
- 4a) Of the above claim(s) 1 and 15-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- |                                                                                              |                                                                             |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other:                                          |

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**DETAILED ACTION*****Election/Restrictions***

1. This application contains claims 1 and 15-17 drawn to an invention nonelected without traverse in Paper No. 8. A complete reply to the final rejection must include cancelation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 18-29 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 18-29: There is no disclosure which would enable one of ordinary skill in the art to make the invention which would enable one of ordinary skill in the art to have practiced the invention without undue experimentation. Applicant claims the deposition of an "intermediate substance" other than the luminescent material that "form[s] a liquid phase at the crystallization temperature". However, neither the specification nor the prior art gives much, if any, guidance or teaching as to the selection of any such material. Therefore, one of ordinary skill in the art would have had to have performed undue experimentation in order to have found such a material and thereby to have practiced practice the invention.

Claims 23 and 27: There is no disclosure that would enable the use of a non-luminescent intermediate material that contains an activator that acts as a luminescent activator. The claim appears to require the impossibility of using a material that is both luminescent and non-luminescent.

Claims 24-26 and 28-29: The terms "regular structure" and "structure with crystallographically-symmetric character" are not defined by the specification nor the prior art, and it is not clear what the terms mean. One of ordinary skill in the art would not be able to perform the claims without undue experimentation because it is not clear what "regular

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structure” and “structure with crystallographically-symmetric character” mean and because neither the specification nor the prior art gives any guidance as to how such structures are created.

4. Claims 18-29 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 18 (and dependent): There is no support for the limitation that the crystallization temperature is that of a single-crystalline material that is part of the substrate on which an intermediate material is deposited. In fact, there is no support in the specification as originally filed to identify what material the “crystallization temperature” referred to because the specification is not clear on the subject.

There is no support for the limitation that the intermediate material is “non-luminescent”. The specification as originally filed recites that the intermediate material is different from the luminescent material (e.g., original claim 18), but does not explicitly indicate that the intermediate material is non-luminescent. As noted in the previous Office Action, Paper No. 9, p. 3, final paragraph, it was not clear from the originally filed specification and claims whether or not the intermediate material was luminescent.

There is no support for the limitation to deposit an intermediate material on a substrate that comprises single-crystalline columns before depositing a luminescent material. In fact, Applicant even argues that it is *not* the invention to deposit an intermediate material on a single-crystalline substrate, but rather to deposit an intermediate material on a substrate and then a single-crystalline luminescent material on the intermediate material (Applicant’s response, Paper No. 10, p. 4, final paragraph).

Claims 23 and 27: There is no disclosure in the originally-filed specification of the use of a non-luminescent intermediate material that contains an activator that acts as a luminescent activator. The claim appears to require the impossibility of using a material that is both luminescent and non-luminescent.

Claims 25-26 and 28-29: There is no disclosure that the a structure formed on the substrate is of “regular character” nor of “crystallographically-symmetric” character. (The

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originally filed specification applies the adjectives “regular” and “crystallographically-symmetric” to the noun “inhomogenities”.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 18-29 are rejected under 35 U.S.C. 112, second paragraph, as failing to set forth the subject matter which applicant(s) regard as their invention. Evidence that claims 18-29 fail(s) to correspond in scope with that which applicant(s) regard as the invention can be found in Paper No. 10 filed 11/21/2002. In that paper, applicant has stated that the intermediate material is formed before the single-crystalline luminescent columns (Paper No. 10, p. 4, final paragraph), and this statement indicates that the invention is different from what is defined in the claim(s) because the claims require that the intermediate material is deposited on single-crystalline columns. (The Examiner considered this aspect of the invention to be clear in the originally filed claims; see the previous Office Action, Paper No. 9, p. 3, 4<sup>th</sup> full paragraph (“The phrase “luminescent....”) Independent claim 18 requires providing a substrate comprising single-crystalline columns, depositing an intermediate material on said substrate (which, as stated above, comprises the single-crystalline columns), and depositing a luminescent material different from the intermediate material on the substrate (which, as stated above, comprises the single-crystalline columns).

6. Claims 18-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 18-29: The phrase “an intermediate material...selected to be liquid at the crystallization temperature of the single-crystalline material” is unclear because it is not clear (except in claim 20, which positively recites that “the intermediate material *is* liquid” (emphasis added by examiner)) whether the substance need merely be capable of forming such a liquid or whether the claims actually require the formation of such a liquid phase.

Claims 23 and 27: Claim 23 specifies that at least one chemical element in the intermediate substance “acts as a luminescent activator or co-activator”. However, parent claim 18 requires that the intermediate material be non-luminescent. The claim is unclear because it

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appears to require the impossibility of using a material that is both luminescent and non-luminescent.

Claims 25-26, 28-29: The claim is unclear because the terms “regular structure” and “structure with crystallographically-symmetric character” are not defined in the specification nor the prior art, and therefore it is unclear what the terms mean.

### *Response to Arguments*

7. Applicant's arguments filed 11/21/2002 have been fully considered but they are not persuasive.

Applicant argues that the guidance given on p. 2, 3<sup>rd</sup> paragraph of the summary, provides sufficient enablement to make or use the invention. Specifically, Applicant argues that the cited passage states that the intermediate substance contains more than one chemical element, wherein at least one element operates as a luminescent activator or co-activator, and further argues that such teaching suggests the use of materials such as metallic elements or metal alloys gallium, indium, tin, or lead. The Examiner disagrees. The teaching does suggest any compound with at least two chemical elements, at least one of which can be used as a luminescent activator in any material. Applicant appears to have interpreted the two clauses individually. However, given that the teaching that “the intermediate substance contains more than one chemical element” provides only guidance to use any compound or alloy and that the teaching that it contains “at least one element operates as a luminescent activator or co-activator” allows the use of any compound which contains any atom that can act as a luminescent activator, and that most metals and halogens can act as luminescent activators in inorganic phosphors, the teaching does not narrow the teachings beyond millions, if not billions, of compounds and alloys. As to Applicant's arguments that the teaching would lead one of ordinary skill in the art to select a metallic elements or alloys, there is no further guidance in the specification to select materials such as elements and alloys from the millions of compounds that fulfill the criteria argued by Applicant. In fact, the teaching leads away from the choice of single metallic elements (including all of Applicant's proposed examples: gallium, indium, tin, and lead). The argument above has been directed to Applicant's implicit assumption that the sentences be read individually. However, taken together, they appear to suggest that the intermediate material is

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itself luminescent, unlike the metals or metal alloys suggested by Applicant (indeed, see the previous Office Action, Paper No. 9, p. 3, final paragraph).

Applicant's arguments that one of ordinary skill in the art would have understood the details described from p. 4, 2<sup>nd</sup> full paragraph to p. 5, 4<sup>th</sup> full paragraph are unconvincing because they are unsupported by evidence. In fact, none of the specific details argued by Applicant appears to be evident simply from reading the specification because the specification is extremely unclear and does not provide sufficient detail or description to understand the invention. description of the operation of the invention of p. 4 are noted, but do not provide convincing evidence of enablement because they are not taught in the specification.

Applicant's amendments to address the rejections under 35 USC 112, 2<sup>nd</sup> paragraph have introduced new issues under 35 USC 112, 1<sup>st</sup> and 2<sup>nd</sup> paragraphs.

### *Conclusion*

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Insofar as the claims are understood, the following art appears to be relevant:

U.S. Patent 4,626,694 to Sano et al. teaches the deposition of phosphor material in columns (Fig. 12) by molecular beam epitaxy (MBE) (col. 5, lines 30-44). MBE inherently produces single-crystalline structures and is a vapor deposition technique. There is an intermediate layer (36) on metal substrate (37) that may be a metal oxide or synthetic resin (col. 5, lines 21-29). However, it is unclear whether these materials form liquids at any relevant crystallization temperatures.

U.S. Patent 4,626,739 to Shmulovich teaches the deposition of phosphor material by the formation of a single-crystalline layer of a phosphor (col. 5, lines 9-14) and then etching to form mesas (i.e., columns) (col. 2, lines 49-55; Example; Fig. 1). It is unclear whether the underlying layers (24) (a binder layer which may be made of Al-Si or Au-Si (col. 3, lines 47-50)) or reflective layer (16) (which may be Al or silica (col. 3, lines 43-47)), which are formed on substrate (22) form liquid phases at any relevant crystallization temperatures.

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9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Cleveland whose telephone number is (703) 308-2331. The examiner can normally be reached on 9-5:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 306-3186 for regular communications and (703) 306-3186 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

*MBC*

MBC  
January 24, 2003



SHRIVE P. BECK  
SUPERVISOR, PATENT EXAMINER  
TECHNICAL CENTER 1700